
Update on the WorldSID 50th Injury Risk Curves

Informal Working Group Meeting for Side Impact- WorldSID dummy
Washington
18th of September

Current Status

- ISO/WG6 agreed on a set of injury risk curves to be recommended for the WorldSID 50th in november 2011
- A few points were under discussion at ISO/WG6 in May, 2012
 - Rib deflection to be used to predict the thoracic skeletal risk curve → update presented today
 - Thoracic soft tissue injury risk curve as a function of the Viscous Criterion (Ford provided some data) → work in progress

Skeletal thoracic IRC

- Thoracic skeletal injury risk is traditionally predicted as a function of the **maximum rib deflection** for dummies
 - For ES-2re:
 - There is no abdomen rib
 - Maximum thoracic rib deflection is used in regulation and consumer testing
 - For WorldSID 50th:
 - There are thoracic and abdomen ribs
 - Possibility to consider the maximum thoracic and abdomen rib deflection (considered initially) or the maximum thoracic rib deflection

Skeletal thoracic IRC

- The **AIS code** for the thoracic skeletal injury does **not distinguish** between the ribs being fractured
- However, the severity of the AIS code increases with the risk of flail chest and of **paradoxical chest movement**
- The ribs 10 to 12 (corresponding to the WorldSID 50th abdomen ribs) can be fractured but will not induce any paradoxical chest movement
 - The severity of the AIS due to fractured ribs 10 to 12 will be limited

Skeletal thoracic IRC

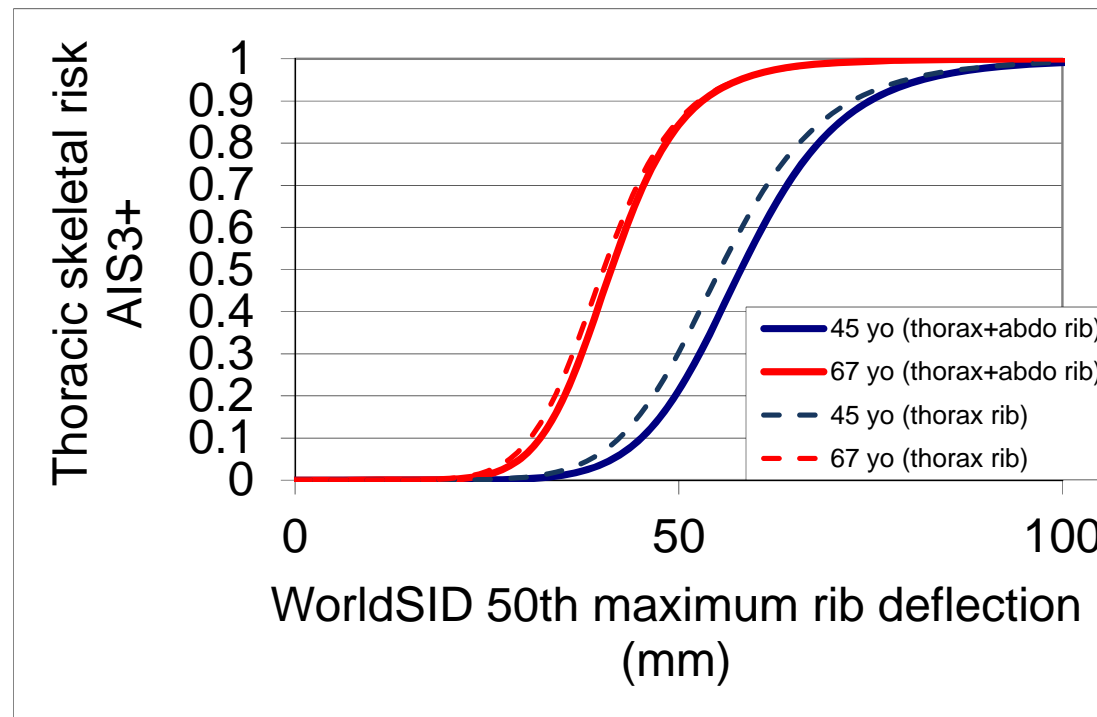
- The 52 PMHS sled tests included in the TR12350 were reviewed.
- The **severity** of the skeletal thoracic AIS is driven by the fractured ribs **corresponding to the thoracic ribs of the WorldSID 50th**
 - There was **no case with lower rib fractures** (ribs 10 to 12) and **without upper rib fractures** (ribs 1 to 9).
 - In 98% of the 52 PMHS sled tests, the AIS attributed to each test based:
 - On the fractured ribs (upper and lower) were the same
 - On the fractured upper ribs only

Skeletal thoracic IRC

- Moreover, the limit recommended for the **abdomen soft tissue protection** allows to protect the **lower ribs**
 - WorldSID data are available for 27 sled tests
 - In 89% of these sled tests (24 out of the 27), the limit recommended for the abdomen soft tissue injury protection would allow to prevent from fractured lower ribs AIS3
 - The remaining 3 sled tests had a skeletal risk AIS3+ due to fractured upper ribs

Skeletal thoracic IRC

- **ISO/WG6 recommends using the skeletal thoracic injury risk curve as a function of the maximum thoracic rib deflection (dotted lines)**



WorldSID 50th maximum thoracic and abdomen rib deflection (mm)= Solid lines
or

WorldSID 50th maximum thoracic rib deflection (mm)= Dotted lines

Skeletal thoracic IRC

➤ Recommended skeletal thoracic injury risk curve

Maximum thoracic rib deflection (mm) (measured by 1D ir tracc)	5% AIS3+	quality index at 5% AIS3+	25% AIS3+	quality index at 25% AIS3+	50% AIS3+	quality index at 50% AIS3+
45 year old	38.5	fair	48.4	good	55.4	good
67 year old	28.0	fair	35.1	good	40.2	good

